TracMap 33x User Manual

Firmware Version 1.7.5

TracMap Ltd
21b Gladstone Road South
Mosgiel 9024
New Zealand

+64 3 489 2952
0800 TRACMAP

Copyright © 2010 TracMap Ltd. All rights reserved.

No part of this manual may be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form without prior written consent from TracMap NZ Ltd.

Software License Agreement

The operating system software on the TracMap unit is licensed under the GNU General Public License, version 2. For the full text of this license, see Appendix B. Note that this license does not cover the TracMap software itself.

The TracMap application software is covered by the license in Appendix B.

Table of Contents

1 Terms of Trade....1
1.1 Limitation of Liability....1
1.2 Consumer Guarantees Act 1993....1
1.3 Warranty....2
1.4 Disclaimer....2
1.5 Important - Safety....2
1.6 Application....3
2 Introduction....4
2.1 Overview....4
2.2 Using this Manual....4
3 TM33x3 Quick Start....5
3.1 Navigation Screen....5
3.2 Keypad....6
3.3 Using the Key Pad to enter text....7
Main Menu....9
3.4 Job Menu....10
4 Using the TM33333x....10
4.1 Turn On....10
4.1.1 GPS Fix....10
4.2 Navigation Screen – No Job Open....10
4.2.1 Navigation Screen – More Views....11
4.3 Main Menu....12
4.4 New Job....13
4.4.1 Block Name....15
4.4.2 Spread....15
4.4.3 During Job....15
4.5 Job Menu....17
4.5.1 Add Products....18
4.5.2 Area....18
4.5.3 Shapes....19
4.5.4 Hazards....19
4.5.5 Measure....21
4.5.6 Drawing a shape using the cursor....21

4.5.7 Stop Job....22
4.5.8 Other Job Menu Items....22
4.6 Manage Jobs....22
4.6.1 Resume Job....23
4.6.2 Delete Job....23
4.7 Shapes....23
4.7.1 Record....23
Save Shape Menu....24
4.7.2 Manage....25
Rename a Shape....25
Delete a Shape....25
4.7.3 View....25
4.8 Settings....25
4.8.1 Operator (334, 335 Only)....25
4.8.2 Owner....25
Lag....26
USB Upgrade....26
Drivers (334,335)....26
Update Lists (334, 335)....26
Coverage Accuracy....26
4.8.3 Sync (335 Only)....27
4.8.4 Backlight....27
4.8.5 Satellites....27
4.9 A-B Lines....27
4.9.1 Record the guide line....27
4.9.2 Using the A-B Lines....28
4.9.3 A+....28
4.9.4 Show Lines / Hide Lines....28
4.10 Temporary Marks....29
4.11 Permanent Marks....29
4.12 Nudge....29
5 About GPS....30
5.1 Information on GPS Accuracy....30
5.2 Differential GPS....31
6 Installation....32
6.1 Head Unit Mounting....32

6.1.1 Power Supply....33
6.1.2 GPS antenna....33
Appendix A - Technical Specifications....34
Appendix B - Software License Agreement....35
License....35

1 Terms of Trade

All items supplied by TracMap NZ Limited (TracMap) are supplied on the following terms of trade. TracMap may vary these terms by notice.

1.1 Limitation of Liability

1.1.1 TracMap liability for any defect in the items is limited to the purchase price of those items.

1.1.2 Without limiting clause 1.1.1, the Buyer shall ensure that:

(a) the items are fitted by qualified tradesperson; or

(b) the items are fitted to a good trade standard; or

(c) the items are not in any way adapted (or tampered with) to a use for which they are not specifically intended; or

(d) the items are not added to or repaired using components not recommended or approved by the manufacturer of such item.

Notwithstanding any other provision of these Terms of Trade, TracMap will not under any circumstances be responsible for any damage, malfunction and/or cost to repair to items regardless of when and howsoever caused if (a)-(d) above are not complied with.

1.1.3 TracMap shall have no further liability or responsibility for any direct, indirect or consequential injury, loss or damage arising from any supply of goods of any kind.

1.2 Consumer Guarantees Act 1993

1.2.1 Where a supply is for business purposes, the Buyer agrees that the provisions of the Consumer Guarantees Act 1993 do not apply.

1.2.2 Nothing in these terms limits any rights the Buyer may have under the Consumer Guarantees Act 1993.

1.3 Warranty

1.3.1 Subject to these Terms and Conditions, TracMap will accept the return of faulty or defective items which are not reasonably fit for the purposes to which they were supplied for the period specified in this clause from the date of Possession, for either a full refund less any expenses (such as freight), repair of the item by TracMap or replacement of the relevant unit (each at TracMap's option): The period of Warranty is I year for units TM333, TM334 & TM335. The Buyer will pay any associated freight costs.

1.3.2 Without derogating from the above, if the items are returned within 60 days of the Possession Date and the provisions of clause 1.1.2 (a)-(d) are complied with, TracMap will refund the purchase price (less any taxes payable by TracMap) to the Buyer.

1.3.3 All warranties shall be void and TracMap will not accept returned items if the items, including the TracMap unit, have been tampered with in any way. In this event the items may be returned to the Buyer at the Buyer's expense.

1.3.4 The Buyer acknowledges that it is not possible for the TracMap units provide exact location position and the accuracy will cary depending on the GPS reciever connected to the TracMap headunit.

1.4 Disclaimer

Your Tracmap unit incorporates the latest tracking technology available, with many advanced features designed to make your work easier and safer, and to achieve efficiencies of vehicle operation.

We have taken the best care possible in designing and manufacturing this unit to operate successfully in an agricultural environment. However, as a consequence of there being a large number of factors over which Tracmap NZ Limited has no control, the Company, its employees, and its agents will not accept responsibility for any consequential costs, loss of income, or damage which may result from using the Tracmap product.

1.5 Important - Safety

Improper use of the product can lead to death or injury to persons, damage to property and/or malfunction of the product. The product should be repaired by TracMap NZ Ltd or and authorised service agent. You should closely review the safety warnings and directions

as to the proper use of the product in the manual and at all times comply with the same.

Caution – when working in times of poor visibility, or on unfamiliar ground, do not rely on your TracMap unit to ensure you avoid obstacles or dangerous ground. A failure or error in position reporting could have serious consequences.

Warning – This is a class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

1.6 Application

You accept these Terms and Conditions by purchasing the product from TracMap NZ Limited or from one of TracMap NZ Limited product resellers.

If any part of these Terms and Conditions would be unenforceable, the provision must be read down to the extent necessary to avoid that result, and if the provision cannot be read down to that extent, it must be served without affecting the validity and enforceability of the remainder of these Terms and Conditions.

2 Introduction

2.1 Overview

TracMap is a GPS guidance system for agricultural vehicles. TracMap's TM33x series consists of a GPS antenna, a head-unit, a spreading switch and a power supply cable.

2.2 Using this Manual

This version of the TM33x User Manual and should be used with version 1.7.4 of the TM33x software.

Word Used	Means
[any word in square brackets]	Button on Key Pad
Cursor	A black block in a text box
Cycles	Moves through different views/text characters in a continuous cycle
Default	The TM33x will display a value that can be used by default rather than you entering a value. You can replace the default.
Enter	Use the keypad to enter text or numbers into a text box
Screen	What is shown on the screen of the head unit. Most screens display a label at the top that is also used in this manual
Scroll	Use the arrow keys on the rocker pad to move up and down a screen
Select	Scroll down or up the screen to highlight you selection. Press [ENT]
Text Box	An empty rectangle on the scree

3 TM33x Quick Start

We recommend that you read the whole manual however if you are computer literate and know how you want to use your TracMap, this section will help you to start quickly. Do this at your own risk.

Install the TM33x in your vehicle. Section 6 describes how to install the TM33x.

Press to turn the head unit on. The Navigation Screen will be displayed after the GPS fix is obtained. This may take up to 5 minutes when first turned on. If a GPS fix is not obtained go to section 4.1.1.

3.1 Navigation Screen

The navigation screen displays:

- a grid of blue lines that represent 10 m squares on the ground
- a green triangle whose tip represents the GPS antenna
- an orange semi-circle that displays the spread width

The Navigation Screen has 3 additional views that can be accessed by pressing the [TAB] button – see section 4.2.1.

Press [MENU] to access the Main Menu.

If you already know how to use the key pad go to section 4. Otherwise read the following 2 subsections.

3.2 Keypad

The functions of the buttons on the keypad are:

Button	Name	Used To
	ESC	Go back to a previous menu
	TAB (PAGE)	Switch between different views, move between text boxes on the same screen, etc (Some models have PAGE instead of TAB)
	MENU	Display the main menu when no job is open Display the job menu when a job is open
	ENT	Accept a highlighted selection in any screen.
	Rocker pad	Navigate between menu options and within the screen Shift left or right when entering numbers or letters Shift details box between top and bottom of screen in measure function
	+	Zoom in on the Navigation Screen Scroll up by 10 items at a time in a list Scroll through letters and numbers in text boxes
	-	Zoom out on the Navigation Screen Scroll down by 10 items at a time in a list Scroll through letters and numbers in text boxes
	F1	Create a temporary mark to for a position you want to return to later - press once Create a permanent mark - press and hold for two seconds
	F2	Will open area page if a job is open.
	Power	Turn on - hold for 2 seconds Turn off - hold for 3 seconds

3.3 Using the Key Pad to enter text

When the cursor is in a text box (empty rectangle on screen) letters and numbers can be entered using the + and – keys and the arrows on the rocker pad. For example, TRACMAP333 can be entered as follows

Press + till the T appears (hint – for letters near the end of the alphabet it might be quicker to use the - button)

Press > to move to the right

Press + till the R appears

Press > to move to the right

Continue this process till all letters and numbers are entered.

Press the rocker pad down arrow to move to the next screen element.

The text characters that are available are as follows and appear in this order.

A-Z, 0-9, - . @ _

4 Using the TM33x

Install the TM33x in your vehicle – see section 6.

Read sections 3.2 and 3.3 to familiarise yourself with the Key Pad.

In this part of the Manual instructions for use are given outlined as a brief summary. More detailed explanations are provided in subsequent sections of the manual.

4.1 Turn On

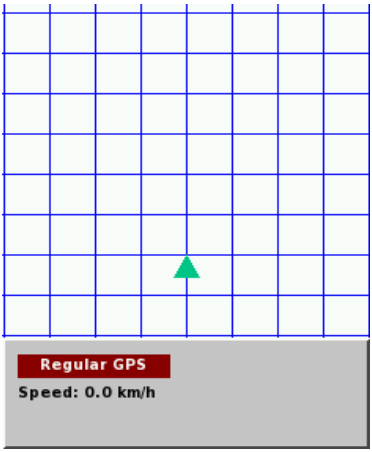
Press the power button for 2 seconds.

The message “Waiting for GPS” will be displayed, as will the Unit ID. When first turned on, and in a new location the unit may take up to 5 minutes to obtain a valid GPS fix. When a GPS fix is obtained the Navigation Screen will be displayed.

4.1.1 GPS Fix

GPS signals are weak radio signals from sateillites. They can easily be interfered with by other radio signals, such as a standard FM radio receiver, and wireless and broadband signals. If you are having trouble getting a GPS fix try changing location and turn off your cellphone and the radio.

4.2 Navigation Screen – No Job Open



The first view of the navigation screen displays:

- grid of blue lines that represent 10 m squares on the ground
- green triangle whose tip represents the GPS antenna
- type of GPS received (Regular or Differential)
- speed of vehicle (kph)

Press [MENU] to access the main menu from the Navigation Screen.

4.2.1 Navigation Screen – More Views

Three more views of the Navigation Screen are available. Press [TAB] to cycle through theses views.

- Location, Speed, Heading, Date, Time
  - Location: GPS coordinates, Latitude, Longitude
  - Speed: the speed the vehicle is moving (km/h)
  - Heading: the direction the vehicle is heading (**N**, **S**, **E**, **W**)
  - Date: current date
  - Time: current time in 12hr format
- Spread Width, Spreading/Not Spreading, Block Name
- Grid and green triangle without type, speed and spread

4.3 Main Menu

The main menu has the following items and is navigated by using the rocker pad up and down arrows.

Menu Item	Menu Sub-item	Used To	Manual Section
New Job		Create a new job	4.4
Manage Jobs		View, update and delete existing jobs	4.6
About		View software version details and TracMap contact details	
Shapes	Record	Record shapes to use for calculating areas or for driving later (e.g., in the dark)	4.7.1
	Manage	Delete or Rename shapes	4.7.2
	View	View shapes and select to use	4.7.3
Settings	Operator	Set drivers and products	4.8.1
	Owner	View lag details for each owner	4.8.2
Sync		Sync jobs with TracMap office data mapping system (335 only)	4.8.3
Backlight		Adjust the backlight	4.8.4
Satellites		View satellite constellation	4.8.5

Select a Main Menu item by pressing the [ENT] key. The sections below describe what you can do with each selection.

4.4 New Job

The New Job screen will be displayed.

Select client from list (334, 335 models only)

Enter Block Name (optional)

Enter Spread (Press [-] to access the high numbers quickly)

Add products (optional - 334, 335 models only)

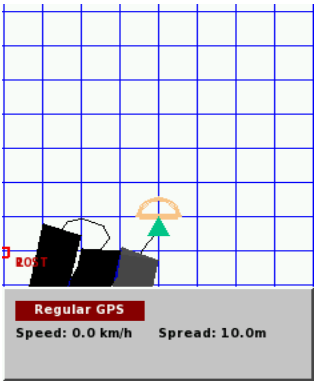
Select **Start**

The job will be started and the navigation screen will be displayed with these additional items.

- orange semi-circle that displays the spread width (m) on the grid
- spread width (also represents spray boom width) set at the bottom of the screen

Start moving.

- When the spreader switch is off, a thin black line showing your movements will be displayed.
- When the spreader switch is on, a wider track that matches the spread width coverage will be displayed.



Press the [+] and [-] keys to zoom in and out as you drive.

Blue appearing in wide black coverage lines shows overlap. Correct your course accordingly.

4.4.1 Block Name

The Block name is used to give the new job a memorable name. The block name is optional, but it is useful when a job is resumed or reviewed later. You can re-use the same block name on several jobs since jobs are also stored with date information. See Section 4.6 for managing existing jobs.

4.4.2 Spread

The spread width is the total width of the track to be recorded (for fertiliser spread or spray boom width). It is centered on the GPS antenna and will be ½ of the spread width to the left of the receiver and vehicle and ½ of the spread width to the right. The spread width must be a number greater than 0 (zero), but can include fractional decimal values. To enter a decimal use the [+] and [-] keys to cycle the text until a '.' (period) displays in the text field. See Section 3.3 for details on entering text.

4.4.3 During Job

After the job has been started drive around the field and your movements will display on the screen and be recorded in the head unit.

As you are driving the following information will be displayed (if it isn't press [TAB] until it is, similarly press [TAB] to not display)

- Spread - the spread width you entered. To change spread width go to Section 4.6.1
- Spreading: shows boom width (e.g. 5.0m) if switch is on and 0.0m if it is off.
- Speed: (km/h)
- Block Name: displays the block name input when job created.

During a job more features are available to be used in the Job Menu. To display the Job Menu, ensure a job is open.

Press [MENU]

4.5 Job Menu

The Job menu has the following items and is navigated by using the rocker pad up and down arrows.

Menu Item	Menu Sub-item	Used To	Manual Section
Area		View area covered and area remaining	4.5.1
Shapes		View shapes and select to use	4.5.2
Hazards		View list of hazards	4.5.3
Measure		View job – pan and zoom Measure distances Create shapes	4.5.4
Stop Job		Stop Job (job information saved automatically)	4.5.6
A-B Lines	Spacing	Set width between lines (metres)	4.9.1
	Granularity	Sets width that each light on the guide bar represents (metres)	4.9.1
	Mode	Set lightbar mode to pull or chase	4.9.1
	Mark A	Mark beginning of line	4.9.1
	Mark B	Mark end of line	4.9.1
	Show lines	View the guidelines and lightbar guide	4.9.4
	Hide lines	Hide guidelines and lightbar guide	4.9.4
	A+	Shift A-B line to present position	4.9.3

Menu Item	Menu Sub-item	Used To	Manual Section
Nudge Mark	Place	Create reference point when leaving an unfinished job (e.g., centre of gateway)	4.12
	Match	Match current position to the nudge mark placed earlier (**Place**) to adjust for 'GPS drift'	4.12

Select a Job Menu item. The sections below describe what you can do with each selection.

4.5.1 Add Products

Allow products (e.g Urea) to be associated with a job. Within a job press [MENU] and select Add Product. Then select Add product again to open the products list. Use the up and down arrows to select the desired product and press [ENT]. If required enter a rate and unit before selecting Accept.

4.5.2 Area

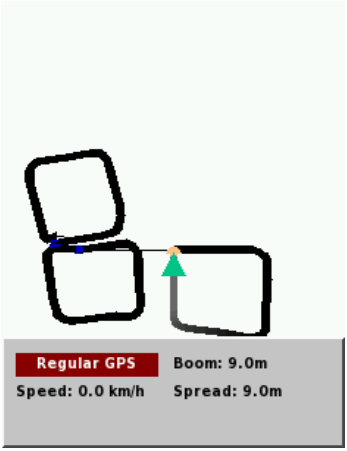
There are two ways that the area calculation can work.

The first way is to drive the outline of your paddock. After the first loop has been created, the area will be automatically calculated for the job. Simply press the [F2] button on the keyboard to view the Area screen and the following information is displayed.

- Covered (area covered in hectares)
- Remaining (remaining area to be covered in hectares)
- Total (Covered + Remaining)

Press [ESC] to return to the navigation screen. As you continue to cover the paddock you can at anytime press [F2] to get updated area information.

As more paddocks are created a new cumulative area will be calculated as well as the area for each seperate region. Use the < > rocker pad arrows to cycle through the area calculations for each region (if multiple paddocks have been covered). You can also use the Up and Down rocker pad arrows to move the information box to top or bottom of screen.



The second way to calculate area is to use Shapes, see the **Area** feature described in section 4.7 to attach prerecorded shapes to a job.

Note: if you have not completed a closed loop with spreading on or no areas (shapes) have been selected to use the screen will be blank and the overview empty.

Area calculation is area measured on a flat plane, with no adjustment for slope or overlap on headlands.

Note: The area calculation is an approximate guide only and can be out by around 5% in some circumstances

4.5.3 Shapes

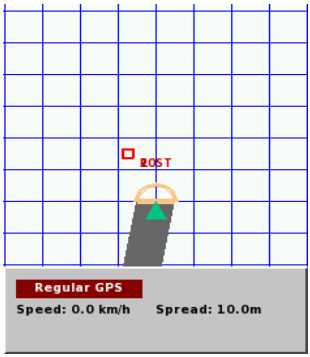
A list of pre-recorded Shapes available to be used will be displayed (to record a shape go to section 4.7.1). Scroll through the list and select the shape(s) you wish to use. An '*' will appear in the **USE** column for the selected shape. Select the shape again to remove it from use – the '*' will disappear from the **USE** column. You can select as many shapes as you would like to use in this job.

To create Shapes by recording them as you drive around, use the Shapes feature in the Main Menu - see Section 4.7 .

4.5.4 Hazards

A list with “Add New” and any existing Hazards will be displayed.

The Tracmap can permanently record waypoint markers for physical hazards or points of interest. These hazards are displayed as icons on the navigation screen whenever you are in a job. In the TM334 & 335 hazards are linked to a customer and will disappear when you start a job with a different.



There are two ways to add a hazard.

The first way is to press F1 for 3 seconds and the Hazard details screen will display the following.

- Name (default is a number)
- Latitude point

- Longitude point
- Type of icon to be displayed on screen (default option = red square)

Enter the **Name** of the Hazard or use the default number and the **Type** of icon to be displayed.

To change the icon for the hazard that is displayed on screen, select **Type**, scroll to the Red Square or Green triangle, select (remember “select” means highlight and press [ENT]).

The second way is to select **HAZARD** from the Job Menu, then select “Add New” from the list that is displayed then complete the hazard details as described above.

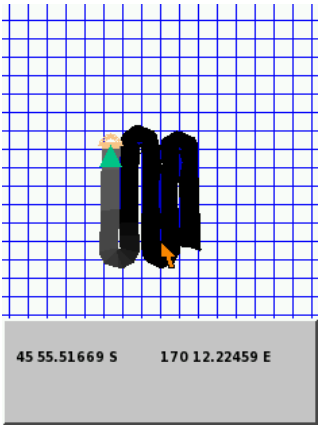
To view the details of an existing hazard scroll the list and select the Hazard required. The Hazard details as described above will display.

To change the details displayed scroll to the detail to be changed, enter the new details, select **SAVE**.

4.5.5 Measure

While in a job, you may browse the map, zoom in on areas different to your present location, and measure lengths between points of interest (for example, to find the width of a paddock). You must be in an open job to use measure.

Press [MENU]. Select **Measure**.



The navigation screen will be displayed with an orange arrow over your present position. Move the cursor around using the rocker pad arrows and use the [+] and [–] buttons to zoom in and out.

Press [ENT] to mark a start point then [ENT] to make subsequent points. As you move the cursor around, the screen will show all marked points joined by an orange line. The length of this line (metres) will be displayed at the bottom of the screen.

To remove points, starting with the most recently added, press [ESC]. Pressing [ESC] when there are no points selected will bring you back into the navigation screen.

4.5.6 Drawing a shape using the cursor

Draw a shape with the cursor to determine the area of part of a job, or create a shape file for later use, such as the shape of a paddock. You must be in an open job to do this.

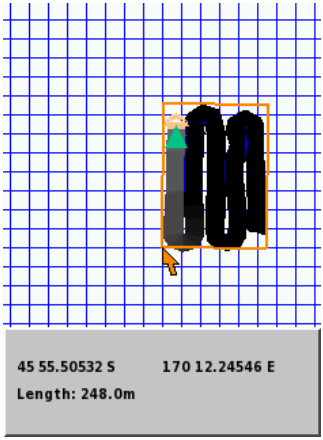
Use Measure as described above menu option to bring up the orange pointer and draw a shape by moving the orange pointer cursor around using the rocker pad arrows, and press [ENT] at each turn point.

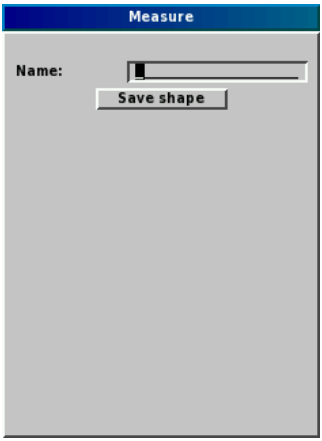
To exit without saving the shape, press [ESC].

To save the shape press [MENU]. The Measure screen will be displayed.

Enter a name, select Save Shape. The shape will be saved and the Navigation screen will be displayed.

To find the area of the saved shape and/or use it in a job, Press [MENU] to go back to job menu. Select **Shapes** to display a list of all saved shapes. The shape just created, and its area, will be displayed at the bottom of the list. Highlight the shape and press [ENT] to use the shape in this job (an * will appear in the **USE** column).





4.5.7 Stop Job

The job will be stopped and the job information will be saved.The 335 will ask if the job is finished. Finished jobs are marked for synchronisation with the tracmap office server using the onboard data model.

Storage varies between models with the 335 having the most and 333 the least.

Use the Stop Job feature to suspend the job for completion later and to finish completed jobs.

When refilling in the same paddock or block, there is no need to stop the job. If you are travelling some distance to refill you may want to stop the job while refilling. When you return to the paddock, resume the job (see section 4.6.1).

4.5.8 Other Job Menu Items

The remaining Job menu items are described in subsequent sections.

4.6 Manage Jobs

To access the Mange Jobs menu you must ensure that there is no job open. Otherwise this menu option will not be available.

Select Manage Jobs. The job file list will display.

Select the required job and the job details will be displayed.

- Date started
- Block name

This screen will also display the following options.

- Resume – resume a stopped job
- Finished (335 only) – Mark as finished for syncing
- Delete – delete a job
- Export (334, 335 only) – Export job to USB
- Exit – exit from this job

4.6.1 Resume Job

The Block Name and Spread Width will be displayed.

Change the 'spread width' if required.

Select Start

The job will resume and the Navigation Screen will be displayed.

Select Cancel to return to Job details file list.

4.6.2 Delete Job

Within the Job file list, highlight the job to be deleted, press [ENT], select **DELETE**, and confirm.

4.7 Shapes

The Shapes menu is used to record the shape of a paddock or paddocks (or other land areas). These shapes can then be displayed on the navigation screen to be used in guidance. The TM33x will calculate the area of the shape using the **Area** feature.

Shapes also allow you to continue working during times of poor visibility, such as dusk, and for a replacement driver to know what areas of a job still need to be competed.

Caution – when working in times of poor visibility, or on unfamiliar ground, do not rely on the TM33x display to ensure you avoid obstacles or dangerous ground. A failure or error in position reporting could have serious consequences.

As you work, the area covered trail will appear in black over the shape.

You can work with multiple shapes to calculate cumulative area. Use **View** to select the shapes to be used.

The next section describes how to make a shape by recording it as you drive. Section 4.5.5 describes how to make a shape by drawing it on the screen with the cursor.

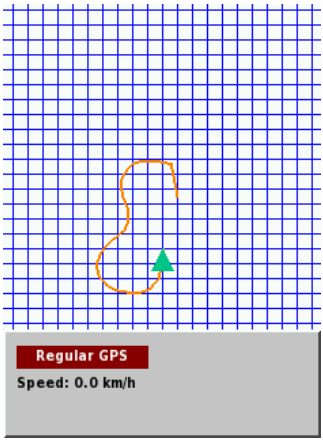
4.7.1 Record

This is a useful function when trying to establish the correct size for a shape. (e.g. to erect a temporary block grazing fence).

Select **Record** and the navigation screen will display. Start driving, TM33x will begin recording the shape. Be careful to stay at a constant distance from the edge you are driving around.

As you drive around you will see an orange trail on screen that shows the

shape you are recording.



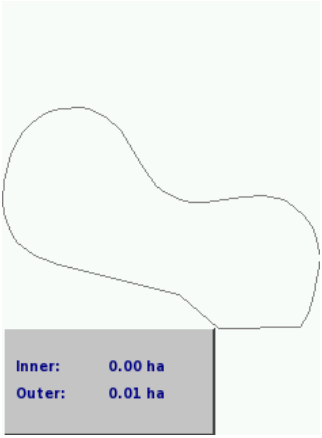
Save Recording Menu

When you have reached a point where it would be a straight line back to your start position press [MENU]. You will see the following items -

- Offset (m) – The distance from the GPS reciever to the boundary of the shape (see below).
- Area – after recording the shape select **Area** to view the area of the shape and to save the shape (see below)
- Discard – to stop recording without saving a shape select **Discard**, confirm.
- Backlight – see section 4.8.3
- Satellites – see section 4.8.4

If required set an offset distance . Then click area.

If there is no offset the shape outline will be displayed onscreen as a single line.



If there is an offset you will see two shapes onscreen. The grey shape represents the shape if the offset is to be applied to the outside and the green shape represent an offset to the inside.

Save Shape Menu

The Save Shape Menu will be displayed after selecting **Area** from the Shape Record menu after you have recorded a shape. View the shape outline and press [ENT].

Enter a block name and chose either:

- Save Inner to save the area inside offset track (green area only).
- Save Outer to save the area outside offset track (grey and green areas).
- Cancel to continue shape recording without saving.

4.7.2 Manage

Rename a Shape

From the Shapes list Select Shape file, Enter a new 'Name', then select **Rename**.

Delete a Shape

From the Shapes list Select Shape file, select **Delete**, confirm. Press [ESC] to return to the navigation screen.

4.7.3 View

This section describes how to view shapes when a job is not open.

Select View and the Shapes list will be displayed. Scroll down to the shape you wish to view and press [ENT]. This will place a * in the **USE** column. Scroll up to 'View shapes' and press [ENT]. The shape will be displayed. You can view multiple shapes by selecting those required then selecting 'View shapes'. To remove a shape from view, Select it, and the * will disappear from the **USE** column.

4.8 Settings

The Settings section of the Main Menu has three items.

- Owner
- Backlight
- Satellite

Select a Settings item. The sections below describe what you can do with each selection.

4.8.1 Operator (334, 335 Only)

The Operator Setting allows you to set the Current Driver and edit the products list.

4.8.2 Owner

The Owner Settings screen will be displayed. This screen can be used to enter the lag.

Lag

Enter Lag (metres)

Select **Save Changes**

The lag correction is the figure used to adjust for the fact that the product being spread is not hitting the ground at the position of the GPS antenna.

For Spray Rigs, this is a one off setting of the distance between the GPS antenna and boom.

For Fertiliser Spreaders, lag should be set at the distance from the GPS antenna to where 50% of the product normally hits the ground.

Clients (334,335)

Stores the list of clients associated with jobs.

Select Add New to input new clients.

Drivers (334,335)

Stores the list of drivers associated with jobs.

Select Add New to input new Drivers.

Update Lists (334, 335)

Used by TracMap staff for admin purposes.

Coverage Accuracy (334, 335)

This setting is used to determine the frequency at which GPS points are logged in the job log and the accuracy of the recorded coverage onscreen. The higher the setting the greater the accuracy. However the job size also increases with the higher settings, resulting in more memory usage and

slowing down of screen refresh as the job area increases.

The 333 has 2 accuracy settings, while the 334 and 335 have 4 accuracy settings.

4.8.3 Sync (335 Only)

Allow you to synchronise finished jobs to the TracMap Office data mapping system via cellular network (must be within the cell coverage area for this to work).

On the synchronistation screen the signal strength is shown green in the bar at the top of the screen. This should be over half of the bar or the job may fail to send.

If the signal is strong and you are still having trouble sending jobs try cutting down the number of jobs that you are sending by changing some to unfinished. Is one job in particular will not send try Unfinishing and re-Finishing the job.

4.8.4 Backlight

The backlight adjuster will be displayed. Use the rocker pad keys to move the box on screen left or right to adjust.

You can alter the backlight of the head unit to make the screen easier to see in different light conditions. Most people prefer low light at night (near the left end of the adjuster), and high in the day time.

4.8.5 Satellites

This screen displays a diagram showing GPS satellite constellations and a message indicating if the GPS fix is OK.

The TM33x typically requires only 4 satellites to gain a fix, however some of the higher accuracy GPS receiver options can require 6 satellites to operate. Generally, the more satellites, the better the accuracy.

If the signal is weak, the colours will be red and there are likely to be problems with the GPS. This may be caused either by poor satellite reception, or by a faulty data connection. To fix, try the following.

Turn off cellphone and radio, this may interfere with satellite reception.

To determine the cause, first move the receiver to a location with a clear view of the sky. Select **Satellites** from the menu to check Satellite

reception.

4.9 A-B Lines

A-B lines are used to form a set of straight lines parallel to a line that you record. They are displayed in red on the navigation screen. You can use A-B lines to guide the placement of irrigation, or anything else that needs to be placed/done in parallel rows on the ground, e.g. spreading or mowing in lines.

4.9.1 Record the guide line

With a job open press [MENU], scroll down to the part of the menu labelled **A-B Lines**.

In the SPACING box, enter the width in metres required between the lines.

In the GRANULARITY box enter the accuracy you require from the guide bar lights at the top of the screen (when working in regular GPS mode, it is recommended you do not set the granularity at less than 2 metres).

Select MODE, select either Pull (drive away from the guide bar lights) or Chase (drive towards the lights).

At the start of your first line select MARK A. The navigation screen will display again. Drive along the line you want to use as your reference. Towards the end of the line press MENU, scroll down to Mark B then at the end of the line select MARK B. You have created the guide line.

You can reposition the A and B points at any time using process.

4.9.2 Using the A-B Lines

The navigation screen will display red A – B lines. The middle heavier weight line is the line you recorded, the lighter lines are those determined by the spacing you entered. A series of guide bar light boxes will appear across the top of the screen. Each box represents the distance (set in **GRANULARITY**) you are from the guide line.

Follow the lines to achieve the placement required. If you deviate from the line, the guide bar light boxes will change from green to red. Correct course and the boxes will show green.

As you turn and drive across the end of the paddock, the screen will keep creating A – B lines at the set widths. Turn down any line.

4.9.3 A+

To move an A-B line parallel to the original line if, for example, you have completed a run at less than optimum spacing to avoid a drain or a fence, position your vehicle where the A-B line should pass through, press [MENU], select A+.

4.9.4 Show Lines / Hide Lines

To remove A-B lines and guide bar lights from the screen

Press [MENU], select **Hide Lines**.

To show A-B lines and guide bar lights on the screen

Press [MENU], select **Show Lines**.

4.10 Temporary Marks

There will be times when you want to create a temporary mark of a position you want to return to. For example, at the end of a load you may want to continue spreading/spraying in order to clean out the hopper/tank, even though it will not be giving adequate coverage.

This will show on the screen display as being covered, yet you plan to return and cover it again later with a fresh load.

This feature allows you to create a mark at the point you want to start again from.

Briefly press the [F1] button. A red box symbol will appear on screen.

Caution: each time you press the [F1] button the marker symbol will shift to your present position. Be careful not to press again until you are back on site, or no longer require the mark at its old position.

4.11 Permanent Marks

While in a job, it is possible to permanently mark hazards or points of interest. This is described in section 4.5.3.

4.12 Nudge

Due to satellite positions changing constantly in the sky, or a new satellite appearing over the horizon, the calculated position will constantly drift. When actively working in a paddock or block, this drift (typically 2-4 metres per hour) is not enough to cause a problem.

However, it can cause a problem achieving accurate alignment if you return to a previously saved job, or have a significant time pause during a job. The remedy for this is to use the **NUDGE** function in the Job Menu.

When leaving a block to come back at a later time, find a position you can return to with absolute accuracy. The centre of a gateway, or adjacent to a fixed item such as a water trough are good options. Avoid sites where you may get inaccurate GPS reception, such as next to trees, buildings, or under electricity lines.

Park in position, press [MENU], select PLACE

You can now end the job.

When you return to the paddock, park the vehicle with the GPS antenna in exactly the same position as when you created your original mark. If you stopped the job when you left it before, resume it now.

Press [MENU]. Select MATCH. This will shift the tracks on screen to align with the present GPS positional fix.

When working in Differential GPS mode, be very careful to exactly align your GPS antenna, otherwise you risk increasing the error rather than improving it.

5 About GPS

Global Positioning System (GPS) is a worldwide radio navigation system formed from a constellation of satellites and their ground stations. To use GPS you need a GPS receiver. The receiver measures distance using the time required for a radio signal to travel from the satellite. It uses trilateration (like triangulation) measures from at least 4 satellites to work out where the receiver is. Different receivers are able to provide different levels of accuracy.

Your TM33x comes standard with a Garmin GPS 18x 5Hz GPS antenna (receiver). For autonomous (meaning no differential correction signal) the Garmin normally achieves 1 to 2 metres accuracy on a pass to pass basis, however under adverse circumstances will be less accurate. TracMap can provide an upgrade to a GPS antenna with greater accuracy.

5.1 Information on GPS Accuracy

While the global positioning satellite system is very good technology, and capable of providing an accurate position fix, often within 2 metres, it must be used with caution. Positional errors are due to a number of factors, the most important being:

- The number of satellites available
- The position or accuracy of those satellites in their orbits 24,000 kilometres above the earth
- The accuracy of the atomic clocks within those satellites
- The accuracy of the clock and computer processing chips inside your Tracmap receiver
- Distortion of satellite track through the atmosphere
- The signal bouncing off adjacent buildings, giving a false track length

The GPS antenna applies some “fuzzy logic” to all of the position information it receives from the various satellites, to make a “best guess” at your present position. When working on hill country this “best guess” can often jump significantly as a result of changing the satellites in view when changing from one side of a hill to the other.

Accordingly, when operating without differential correction signal in hill country, a common sense approach should be taken to relying on the accuracy of the GPS fix.

5.2 Differential GPS

Differential GPS is achieved by having a ground station which monitors the GPS errors, and then transmitting an adjustment or correction signal. A dedicated receiver on the vehicle picks up and applies the correction to the “raw” signal from the GPS satellites.

Depending on your source of GPS correction signal, you may lose it due to shading from contour or dense shelterbelts.

In these situations your GPS antenna will continue to operate however accuracy will be reduced.

Your GPS signal status is displayed on the information page, (reached by consecutively pressing TAB), and at the bottom of one of the navigation screens.

6 Installation

6.1 Head Unit Mounting

Locate a suitable place to mount the head unit where the driver can see it and use it with ease - see examples below.

You may need to fabricate a small metal bracket to mount the pedestal on, or purchase one from TracMap.

The Garmin GPS antenna needs to be mounted on the roof in the centre line of the vehicle, not to one side. If it's a plastic roof, then the antenna will need to placed on a metal plate that will need to be glued to the roof. If it's a metal roof, the Garmin is a magnetic mount antenna, and will stay where it is placed. Keep the antenna away from other transmitting antennas that may be on the roof. Run the antenna cable inside the vehicle.

Use the Velcro to attach the spreading switch to the head unit or in the vehicle where the driver can easily reach it.

Plug the blue plug into blue socket and the green plug into the green socket. Plug the power supply into the cigarette lighter.

Now the hardware side of the installation is complete, you just need to configure the software. Measure the distance from the GPS antenna to either the spray boom or to where it is expected that 50% of the fertiliser will land. This measurement is called lag. Start the TracMap unit up by holding the power on button down for 2 seconds. The TracMap logo should now appear. The vehicle needs to be outside so the GPS receiver has clear view of the sky. Once the unit has started and acquired a GPS position, you now can enter the settings – see section 4.8.

Once you have done this you can start to use the TM33x.

6.1.1 Power Supply

The unit will operate on any voltage between 8 V and 32 V. Power is supplied through the blue connector (connector 1).

6.1.2 GPS antenna

The green connector (connector 2) supplies 5 V power , and receives data from the GPS antenna. Data is received via an RS-232 interface. Any GPS antenna that produces an *RMC* sentence can be used, provided the baud rate matches one of those supported by the head-unit (see Appendix A).

Appendix A - Technical Specifications

Operating voltage	8 – 32 V
Operating current	270 – 900 mA
Power consumption	7.3 – 13.8 W
GPS baud rates	9600, 19200, 38400, 57600, 115200
GPS sentences	RMC GSA GSV
GPS supply voltage	5 V
GPS supply current	500 mA
Digital input threshold	3 V

Appendix B - Software License Agreement

License

TracMap NZ Limited (``Licensor'') provides the TracMap Flight

Product (``the Program'') and licenses its use subject to the terms and conditions below:

You own the hardware contained in this package and have a license to use the Program embedded within the hardware but the Licensor retains all other legal rights. Title to the software is retained by TracMap NZ Limited.

Permissible Uses

You may:

Use the Program on a single machine and solely as an end user.

Copy the Program into any machine-readable or printed form for backup or modification purposes as part of your use of the Program on your machine.

Modify the Program and/or merge it into another Program for your use on your machine. Any portion of this Program merged into another Program will continue to be subject to the terms and conditions of this license.

Transfer the Program along with any backup copies, modified or merged versions to another party if the other party agrees to accept the terms and conditions of this license having previously received a copy of the license. All materials referred to above not transferred must be destroyed.

Copies

Copyright Notice

You must reproduce and include the copyright notice on any copy, modification or portion of this Program merged into another program.

You may not use, copy, modify, or transfer the Program, in whole or in part, except as expressly provided for in this license. Nor may you disassemble, decompile or reverse engineer the Program.

Term

This license is effective until terminated. You may terminate it at any time by destroying the Program together with all copies in any form. It will also terminate immediately without notice to you if you fail to comply with any term or condition of this license. Upon termination, you agree to destroy the Program forthwith.

Limited warranty

TracMap NZ Limited warrants the hardware on which the Program is furnished to be free from defects in materials and workmanship under normal use for a period of 2 years from the date of delivery to you as evidenced by a copy of your receipt.

The Program is provided ``as is'' without warranty of any kind, either express or implied, including, but not limited to the implied warranties or merchantability and fitness for a particular purpose. TracMap NZ Limited does not warrant that the functions contained in the Program will meet your requirements or that the operation of the Program will be uninterrupted or error free. The entire risk as to the quality and performance of the Program is with you. Should the Program prove defective, you (and not TracMap NZ Limited or its authorised representative) assume the entire cost of all necessary servicing, repair or correction.

Limitations of remedies

TracMap NZ Limited's entire liability and your exclusive remedy is:

The replacement of any hardware not meeting TracMap NZ Limited's ``Limited Warranty'' as stated above and which is returned to TracMap NZ Limited or its authorised representative with a copy of your receipt; or

A refund for the Program of any money paid by you if the Program is returned to TracMap NZ Limited or its authorised representative.

Under no circumstances is TracMap NZ Limited liable to you for any damages, including any special, incidental, indirect or consequential damages arising out of the use or inability to use the Program even if TracMap NZ Limited or its authorised representative has been advised in advance that such damages may arise, or for any claim by any other party.

General

This license will be construed under the laws of New Zealand.

This license contains the entire agreement between the parties and supersedes all prior agreements and/or understandings (oral or written) and any other communications between us relating to the Program.

Failure or delay by TracMap NZ Limited in enforcing any right or provision of the license is not to be deemed a waiver of such provision or right with respect to the breach.

If any provision of this license is held by a court of competent jurisdiction to be contrary to law, that provision will be enforced to the maximum extent permissible, and the remaining provisions of this license will remain in full force and effect.

You may not assign, transfer or sub-license this license except as expressly provided in this license.

GNU General Public License

Version 2, June 1991

Copyright © 1989, 1991 Free Software Foundation, Inc.

51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Library General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

GNU GENERAL PUBLIC LICENSE TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The ``Program", below, refers to any such program or work, and a ``work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term ``modification".) Each licensee is addressed as ``you".

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.

If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for non-commercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your

acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and ``any later version'', you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM ``AS IS'' WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES

SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the “copyright” line and a pointer to where the full notice is found.

one line to give the program's name and a brief idea of what it does.

Copyright (C) *year name of author*

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

Gnomovision version 69, Copyright (C) year name of author

Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'. This is free software, and you are welcome to redistribute it under certain conditions; type `show c' for details.

The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than `show w' and `show c'; they could even be mouse-clicks or menu items--whatever

suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a ``copyright disclaimer'' for the program, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the program `Gnomovision' (which makes passes at compilers) written by James Hacker.

signature of Ty Coon, 1 April 1989

Ty Coon, President of Vice

This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Library General Public License instead of this License.=